ONEIDA NATION OF NEW YORK TRIP REPORT

Assessment of Mold and Moisture Conditions

Final Report

Date:
January 21, 2003

Prepared for:
U.S. Department of Housing & Urban Development
Office of Native American Programs

Prepared by:
UIUC/Building Research Council
One East St. Mary's Road
Champaign, IL 61820

Under sub-contract to:
Magna Systems, Inc.
340 E. Second Street, Suite 409
Los Angeles, CA 90012-4249
UI02 HUD SBC-B-2366

TABLE OF CONTENTS

INTRODUCTION

Kate Brown of the Building Research Council at the University of Illinois and Paul Knight, Magna Systems, Inc. staff, conducted a site visit at the Oneida Nation of New York Reservation on December 12, 2002. The purpose of the site visit was to conduct on–site assessments of mold and moisture conditions in homes located on the reservation. This report summarizes the activities and issues identified while on site. A detailed analysis of the findings and recommendations is found in the attached report, titled: *Technical Housing Assessment Report: Examining Mold and Moisture Conditions of Homes on the Oneida Nation of New York Reservation.*

BACKGROUND INFORMATION

The Oneida Nation of New York Reservation is located in upstate New York. There are approximately 3,786 Native Americans residing on the reservation and trust lands located in Chenango, Cortland, Herkimer, Madison, Oneida, and Onondaga Counties. Upstate New York's winter climate consists of cold temperatures and heavy snowfall.

The Oneida Indian Nation Housing Authority reported mold and moisture problems in homes to the Eastern/Woodlands Office of Native American Programs. The housing authority maintains 30 Low Rent units and has 20 more Low Rent units in development. The housing authority was concerned, because the homes with moisture problems were built in 1994. The housing authority was very interested in confirming their identification of the sources of moisture problems and their remediation plans.

Day 1: Wednesday, December 11, 2002

The assessment team traveled from the St. Regis Mohawk Reservation to the Oneida Nation located in the central section of upstate New York.

Day 2: Thursday, December 12, 2002

On Thursday morning, the assessment team met with Captain Michael Rathsman, Senior Environmental Health Officer with the Indian Health Service. Captain Rathsman accompanied the assessment team on the site visit. In the afternoon, the assessment team met with housing authority staff to discuss the situation on the reservation, outline the procedures while on the reservation, and address their concerns. Staff attending included: Michael Cook, Administrator of Government Programs and Services; Mike Murphy, Project Manager, Diane Daniello, Manager of Nation Rentals; Lenny Babcock, Maintenance Supervisor; and Deb Goldberg of DGI Communications.

The day's activities included an hour discussion with the housing authority staff on mold and moisture issues impacting the Tribe, the type of housing built on the reservation, and current remediation work. Some homes have experienced flooding and site drainage problems. Occupants of one home had to be relocated because of the high moisture load and flooding conditions in the home. The housing authority staff wants to engage in a

proactive approach to address their mold and moisture problems. They were also interested in reviewing a remediation plan for site drainage corrections. The assessment team inspected five Low Rent homes. Digital photographs were taken at each site to record conditions. The inspection process involved visual assessment of both interior and exterior conditions, measurements of relative humidity in the homes, and discussion with residents when available. The attached *Technical Housing Assessment Report: Examining Mold and Moisture Conditions in Homes on the Oneida Nation of New York Reservation* provides a detailed analysis of findings and recommendations for the properties inspected on the reservation.

FINDINGS

An overview of findings and recommendations for the Oneida Nation Reservation of New York follows. The respective *Technical Housing Assessment Report* provides a more detailed discussion and analysis of the findings.

Oneida Nation of New York Reservation

Principal findings from the four homes where remediation work has not been done are listed below.

1. Site drainage could be improved. Dips and holes adjacent to the foundation were found at one home. Drainage away from the homes was basically flat in many instances.
2. All the homes had gutter systems with flip-up leaders. Some of the flip-up leaders were cracked or broken and not working as intended. Leaders and splash blocks were also found missing in a few cases.
3. All of the attics were insulated to R38 with fiberglass insulation. However, numerous gaps and voids in the insulation could be contributing to mold growth on ceilings in some of the homes.

Remediation work at the fifth inspected home involved excavating around the home and installing a new foundation drainage system. Gutters drained to a new foundation drain. The system then was drained to daylight. Grading was done around the home to provide positive drainage away from the home.

Maintenance Management

Many moisture problems, and the resulting mold contamination, are the result of deferred maintenance. Any situation with a water leak should be addressed promptly. If water infiltration problems from plumbing, roofing, or foundation sources linger, a small problem can turn into a larger problem, and the potential for mold can turn into a major contamination site. Unfortunately, water leakage often is unreported and unattended.

A housing authority's best defense against mold and moisture complaints is its maintenance department. A good, proactive, maintenance program regarding mold and moisture problems should include the following procedures:

- Perform regular inspections of properties to identify problem moisture conditions.
- Encourage residents to report moisture problems.
- Respond promptly to identified and reported moisture problems to prevent excessive mold contamination.

Through site visits to several reservation housing authorities, BRC inspection teams have had the opportunity to observe, at least in a secondhand way, the effectiveness of housing authorities' maintenance programs. It should be noted that the Oneida Nation of New York has an excellent maintenance program. The houses inspected had previously had moisture and mold problems and remediation plans have been developed and implemented. This is a significant finding. The Oneida Nation of New York Housing Authority should be complimented for their efforts in operating a maintenance program that deals effectively with maintenance problems.

PROGRAMMATIC RECOMMENDATIONS

A formidable challenge to all housing authorities is the development of a service-delivery system that effectively addresses mold and moisture conditions promptly. This requires a partnership between the housing authority and occupants. A system could include training for the maintenance staff on how to implement the technical recommendations and training for residents on their roles and responsibilities as renters and homeowners. In many cases, moisture problems develop but go unreported and unrepaired, allowing significant mold contamination that could have been avoided. Some strategies to meet these challenges follow:

1. As part of the annual recertification process, require occupants to attend annual homeowner/renter clinics. These clinics would provide instruction on home maintenance issues. Topics such as identifying and repairing leaks and gutter maintenance should be presented.

2. During the annual recertification process, ask occupants to fill-out a survey based on Housing Quality Standards (HQS), which includes additional questions on mold and moisture conditions in their homes. Asking residents to complete surveys engages them in their own home maintenance. The survey responses also will provide information to the Housing Authority on any unreported problems (especially leaks and inoperable fans) that may contribute to an unsafe and unhealthy home environment.

TECHNICAL HOUSING ASSESSMENT REPORT

EXAMINING MOLD AND MOISTURE CONDITIONS OF HOMES ON THE ONEIDA INDIAN NATION RESERVATION

EXECUTIVE SUMMARY

Kate Brown, Building Research Council (BRC) staff and Paul Knight of Magna Systems Inc. inspected five homes on the Oneida Nation of New York Reservation for mold and moisture problems, on December 12th. Debra Goldberg of DGI Communications and Michael Rathsom, Senior Environmental Health Officer with Indian Health Services accompanied them.

Staff members of the Oneida Indian Nation Housing Authority (OINHA) are well aware of the mold and moisture problems affecting the homes on their reservation and are taking proactive measures to eliminate the problems. Mold and moisture problems were found in four of the homes. Moisture remediation work had been completed at the fifth home and no mold was found in that home. The type of remediation work done by OINHA in this home was shared with the assessment team. This work will be done at the other homes that experience moisture problems. The remediation work being done should solve the moisture problems found in the other homes.

Principal findings from the four homes where remediation work has not been done are listed below.

1. Site drainage could be improved. Dips and holes adjacent to the foundation were found at one home. Drainage away from the homes was basically flat in many instances.
2. All the homes had gutter systems with flip-up leaders. Some of the flip-up leaders were cracked, broken or not working as intended. Some leaders and splash blocks were missing.
3. All of the attics were insulated to R38 with fiberglass insulation. However, numerous gaps and voids in the insulation could be contributing to mold growth on ceilings in some homes.

Remediation work at the fifth inspected home involved excavating around the home and installing a new foundation drainage system. Gutters drained to a new foundation drain. The system then drained to daylight. Grading was done around the home to provide positive drainage away from the home.

This report provides technical recommendations and discussion focusing on these items. Appendix A includes a summary of findings at each inspected home. Appendix B provides a detailed assessment of each home.

INTRODUCTION

The Building Research Council (BRC) responded to a request from the Eastern/Woodlands Office of Native American Programs to assess site and structural conditions contributing to mold and moisture problems on the Oneida Nation of New York Reservation. The investigation was conducted on December 12th, 2002, by Building Research Council (BRC) staff member Kate Brown and Paul Knight of Magna Systems. Debra Goldberg of DGI Communications and Michael Rathsom, Senior Environmental Health Officer of Indian Health Services. Members of the Oneida Indian Nation Housing Authority (OINHA) escorted the assessment team. OINHA had pre-selected the houses. The five homes selected for inspection had reported mold and moisture problems. Three of the homes were occupied. Two of the homes were vacant. Mold and moisture remediation work had been completed in one of the vacant homes.

SECTION 1- METHODOLOGY

Visual inspection was used to assess mold and moisture conditions in the homes. The results of the mold and moisture assessments were compiled on a spreadsheet, with broad categories of common moisture problems noted. This data is presented in Appendix A in this report. The findings for the houses experiencing mold and moisture problems are presented in Appendix B. The remediated house is discussed in the body of this report.

Visual Inspection

Housing inspections consisted of visual assessment of mold and moisture conditions. Assessment forms developed for the Chicago Mold and Moisture Project (a HUD Healthy Homes Program) were used to record information. The assessment forms are organized for a room-by-room inspection. All rooms were examined for water damage and evidence of mold. Assessment of kitchens, bathrooms, basements, utility rooms and attics included additional inspection related to plumbing, localized ventilation, water entry and other moisture source issues.

The exterior of the houses were inspected for rain water/snow melt management, including site grading, roof condition and gutter system. Whenever possible, residents were interviewed to gather history on moisture problems, plumbing leaks, winter condensation, health issues, number of occupants and other useful information that could be offered. Indoor temperature and relative humidity measurements were also taken. Digital photographs were taken at each house to visually record notable conditions.

SECTION 2 – HOUSE DESCRIPTIONS

The five inspected homes are part of a twenty home development built in 1994. The homes are located on the adjoining streets of Sweetgrass Lane and Runner's Road. The homes are of similar design and construction (Figure 1). Although the homes are of modular construction, they have interesting spaces and rooflines.

Figure 1 - Typical home in the Oneida development

The homes are one-story ranch-style homes with three or four bedrooms built over basements. Homes are approximately 1,170 ft^2 (first floor only) with attached garages. The homes are 2" x 6" construction. Basement foundation walls are either poured concrete or concrete block. Exterior basement wall insulation was present on some of the homes. According to OINHA staff, not all basement walls are insulated.

Attics are insulated to R38 with fiberglass batt insulation. Roofs are constructed with raised-heel trusses to allow full depth insulation over the top plates (Figure 2). Roof ventilation is provided by a combination of soffit and ridge vents.

Figure 2 - Raised-heel truss allows full depth insulation over top plates

Bathroom and kitchen exhaust fans are vented to the outside. Furnaces are 90% efficient and are direct vent sealed combustion. Water heaters are power vented. Natural gas is the fuel source.

SECTION 3 - FINDINGS

1. Site Drainage

Most of the twenty homes in the development appear to be built on the low part of the site and are experiencing water problems in the basements (Figure 3). Flooding has been an issue in some of the homes. Drainage immediately adjacent to the homes was flat.

Figure 3 - House located near base of hill.

The team found holes and dips caused by settling adjacent to the foundation at 2211 Sweetgrass Lane (Figure 4). Ponds from snowmelt were found behind the home at 3302 Runner's Road.

Figure 4 - Settling against foundation – note presence of exterior basement wall insulation

2. Rainwater/Snowmelt Management

All of the homes had gutter systems that appeared to be in good shape. Flip-up leaders were found in some locations. The leaders were made from a light gauge plastic. Some of the leaders were broken or cracked that may have resulted from being stepped on. Some leaders and splash blocks were missing (Figure 6).

As a result of site drainage, backsplash (Figure 5) and rainwater/snowmelt management problems, mold and moisture problems were being experienced in the basements. Some foundation walls were wet and mold was found on other basement walls (Figures 7 & 8).

Figure 5 - Back splash onto siding from melting snow on roof

Figure 6 -Missing leader and splash block

Figure 7 - Mold growing on basement wall

Figure 8 - Mold on basement wall

3. Attics

The inspected attics were insulated to R38 fiberglass batt insulation. The attics were well vented and included raised heel trusses to allow for full depth of insulation over the top plates. Ice dams were not seen on the homes, nor was snowmelt visible due to inadequate insulation. However, gaps and voids in the insulation were found in all the attics. In some cases, these deficiencies could be the cause of mold growth reported on ceilings.

Figure 9 - Oversized batt not making contact with ceiling gypsum board - wiring and plumbing vent pipes also restrict insulation contact with ceiling gypsum board

Figure 10 - Gaps between pieces of batt insulation

Insulation should be installed as a continuous blanket. At eaves, gaps below the insulation can lead to lower thermal performance. Gaps between batts (Figure 10) can lead to cold spots, made worse if the insulation is suspended up above the ceiling drywall (Figure 9). The inspected homes had discoloration or mold growth possibly from cold spots.

Batts were oversized for the joist cavities and were not pushed-down to make contact with the ceiling gypsum board. The problem was compounded by the presence of wiring plumbing vents, and exhaust fan ducts (Figures 9 & 11). This was the case in the home at 2212 Sweetgrass, where mold was reported on the bathroom ceiling. The temperature of the ceiling drywall may have dropped below the dew point because of the air space between the ceiling and the insulation.

Figure 11 - Insulation not replaced following maintenance work completion

Mold was also reported on the bathroom ceiling at 2211 Sweetgrass. Maintenance work was done on the bathroom exhaust fan, but the attic insulation was not replaced following this

work. (Figure 11).

4. Remediation Work

Remediation work was recently completed at 2204 Sweetgrass. The house had moisture problems that included condensation on windows and walls, site drainage problems and flooding. The family was relocated so remediation efforts could be done. The house will remain vacant until the spring. OINHA is interested in determining if the moisture problems resulting from site drainage return. If the remediation efforts are successful, the house will be occupied in the spring.

A description of the remediation work follows. Pictures provide evidence and resulting effects. The remediated house did not have basement wall insulation nor was any added as part of the remediation work.

Figure 12 - Downspout tied to new foundation drain

The perimeter of the house was excavated (excluding the garage perimeter). Soil from the trench was disposed off-site. The existing footer drain was removed. The *MiraDri* (Figure 13) foundation drainage system and a new 4" diameter perforated PVC foundation drain were installed. Downspouts were tied to the new footer drain (Figure 12). The footer drain was extended to daylight. The trench around the footing and foundation drain was backfilled with stone. The trench adjacent to the foundation wall was

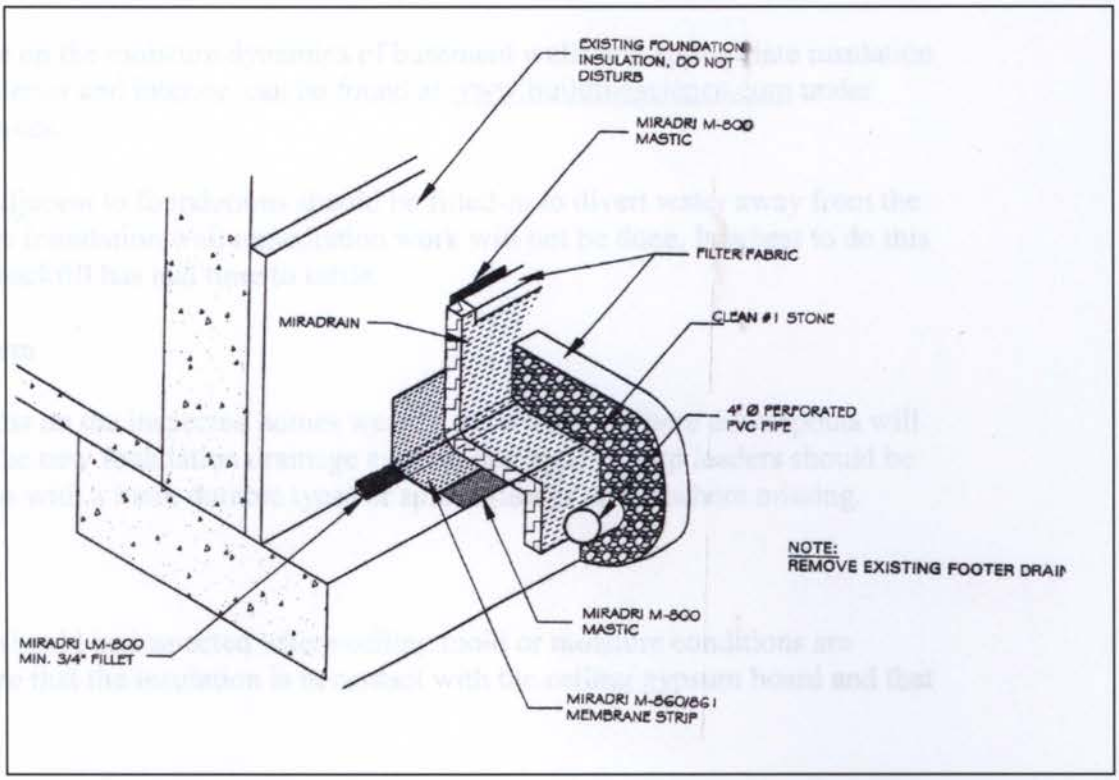

Figure 13 - Foundation remediation system

filled with sand. Topsoil was used to provide positive drainage away from the home. Mold was removed from the interior of the home and surfaces were painted. A higher capacity bathroom exhaust fan was also installed. Total remediation cost was $25,000.

On most building sites, however, there is not sufficient slope of the ground to run a footing drain to daylight.

SECTION 4 – TECHNICAL RECOMMENDATIONS

Recommendations are based on the findings identified during the site visit.

1. Site Drainage

Current remediation efforts should focus on improving site drainage conditions and solving the basement moisture problems. One solution, trenching around the home to install a new foundation system, presents an opportunity to add exterior foundation wall insulation if not already present. It is recommended that 1" (R5) to 2" (R10) of extruded polystyrene insulation be added before the foundation wall drainage system is added. Installing exterior foundation wall insulation has two benefits:

- The R-value of an insulated concrete block or poured concrete wall is between 1 and 2. Adding insulation significantly improves the thermal integrity of the wall resulting in energy savings and a more comfortable basement for the occupants.
- Adding exterior foundation wall insulation elevates the interior foundation wall surface temperature. Condensation on the foundation is less likely to occur, especially during the summer.

A good reference on the moisture dynamics of basement walls and appropriate insulation systems, both exterior and interior, can be found at www.buildingscience.com under Technical Resources.

Holes and dips adjacent to foundations should be filled-in to divert water away from the foundation where foundation wall remediation work will not be done. It is best to do this correction after backfill has had time to settle.

2. Gutter System

The gutter systems on the inspected homes were in good shape. Where downspouts will not be tied into the new foundation drainage system, damaged flip-up leaders should be replaced (perhaps with a more durable type) or splash-blocks added where missing.

3. Attics

Attic insulation should be inspected where ceiling mold or moisture conditions are reported to ensure that the insulation is in contact with the ceiling gypsum board and that

the insulation is continuous without voids or gaps. Consideration should be given to replacing the batt insulation with blown insulation where this condition is prevalent or when rehab work permits it.

4. Bathroom Exhaust Fans

Bathrooms generate large amounts of moisture. Properly operating and vented exhaust fans are keys to removing moisture from this space.

- When rehab work is done in the bathrooms replace bathroom fans with new bathroom fans that have sone ratings no higher than 1.5. Low-sone fans are quiet and occupants are more likely to use them. Low sone fans include Broan *Solitaire* and Panasonic *WhisperCeiling* and *WhisperLite* series. Low-sone fans cost between $75 and $100. Fans should be sized to provide a minimum 75 CFM exhaust at 0.25 inches of water static pressure.
- Where a single switch operates both the bathroom light and fan, replace switch with a fan delay timer. A fan delay timer is a two-function switch that is typically wired to a fan and a light. When the switch is turned-on, both the light and exhaust fan are turned-on. When the switch is turned-off, the light is turned-off but the fan continues to operate for an extended period of time. The extended period of time can be adjusted from 1 to 60 minutes. Fan delay timers are about $35.00 (fan delay timer: www.efi.org).
- Ensure that bathroom and kitchen exhaust ducts are properly attached and sealed to the exhaust fan housings. All ducts should terminate outside the house and not within the soffit area. Ensure that the ducts terminate and are sealed to a vent designed for exhaust fan soffit termination.

APPENDIX A:

SITE VISIT SUMMARY FORM

SITE:__Oneida Nation of New York

DATE:____December 12, 2002

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Inspection Number	Address of Home	HUD Program	Age of Home	Number of Occupants	Foundation Type	Model Type of Home	Framing Type	Heat Type	Interior Temperature - Relative Humidity	Site Drainage Problems	Gutter System Problems	Leaks from Exterior	Wet Basement or Crawl Space	Plumbing Problems	Bathroom Problems	Exhaust Ventilation	Exterior wall/ceiling problems	Attic Problems	Visible Mold (Column #)
1.1	2212 Sweetgrass	LR	8 Yrs.	6	Concrete Block	Modular ranch	2" x 6"	Gas - Forced Air	64 F - 65%	Yes	Missing leader	Yes	Yes	No	Yes	Yes	No	Yes	14,15,16
1.2	2211 Sweetgrass	LR	8 Yrs.	Unoccupied	Poured Concrete	Modular ranch	2" x 6"	Gas - Forced Air	64 F - 45%	Yes	Yes	Yes	Yes	No	No	Yes	No	Yes	16
1.3	3303 Runner's Rd	LR	8 Yrs.	5	Concrete Block	Modular ranch	2" x 6"	Gas - Forced Air	65 F - 70%	Yes	No	Yes	Yes	No	No	Yes	No	Yes	No
1.4	3302 Runner's Rd	LR	8 Yrs.	6	Poured Concrete	Modular ranch	2" x 6"	Gas - Forced Air	66 F - 60%	Yes	Yes	No	Yes	No	No	Yes	No	Yes	14
1.5	2204 Sweetgrass	LR	8 Yrs.	Unoccupied	Concrete Block	Modular ranch	2" x 6"	Gas - Forced Air	60 F - 50%	No	No	No	No	No	No	Yes	No	No	No

MH = Mutual Help
TK= Turnkey = Rent to own
LR= Low Rent

Inspection Number: 1-1
Address: 2212 Sweetgrass
Age: 8 years
Type: Low rent
Condition: Occupied
House Type: Ranch
Bedrooms: 4
Foundation: Concrete block
Heat Type: Gas, forced air
Construction: 2" x 6", modular

Figure 1 - 2212 Sweetgrass

Mold and Moisture Conditions: Mold or moisture problems were found in the home. Basement walls were moldy. Mold was found on the bathroom ceiling. Window condensation was reported in one of the bedrooms.

Rainwater Management: Site grading immediately adjacent to the home was flat. A gutter system was present and in good shape. Flip-up leaders were present, but one was missing. A drainage system was present along the interior of the foundation wall, but did not appear to be pitched properly.

Figure 2 – Insulation not in contact with ceiling gypsum board

Bathroom/Kitchen: Mold was found on the bathroom ceiling. The fan vented through a plastic ribbed duct. The duct terminated above a soffit vent in the eave (Figure 3). The kitchen exhaust fan vented to the outside.

Attic: The attic was insulated with R38 fiberglass batts. The insulation was not in contact with the ceiling drywall (Figure 2), especially over the bathroom ceiling where mold was reported. Some mold was spotted on the roof sheathing near the bathroom exhaust fan termination point.

Figure 3 – Bathroom exhaust fan vented through soffit – some mold is visible on sheathing

Occupant Notes: There were 6 occupants, 2 adults and 4 children, ages 8-17 years. There were no reported smokers in the home. Some family members had allergies. The occupants have resided in the home since 1994.

Inspection Number: 1-2
Address: 2211 Sweetgrass
Age: 8 years
Type: Low rent
Condition: Vacant
House Type: Ranch
Bedrooms: 3
Foundation: Poured concrete
Heat Type: Gas, forced air
Construction: 2" x 6", modular

Figure 1 2211 Sweetgrass

Mold and Moisture Conditions: Site drainage was quite poor. The home was located at the base of a small hill (Figure 2). Localized dips and holes were found adjacent to the foundation. Mold was reported on the bathroom ceiling. The house was vacant and interior remediation efforts were underway.

Figure 2 – Back of home at base of hill

Rainwater Management: A gutter system was present and in good shape. A flip-up leader was broken. Another leader was missing (Figure 3).

Bathroom/Kitchen: Mold was reported on the bathroom ceiling. The fan was vented through the soffit. A soffit vent termination piece was part of the remediation work. (Figure 5). The kitchen exhaust fan vented to the outside.

Figure 3 – Missing leader

Attic: The attic was insulated with R38 fiberglass batts. Insulation was not replaced on the bathroom ceiling following work on the exhaust fan (Figure 4). Voids and gaps in the attic insulation were visible.

Occupant Notes: The home was not occupied.

Figure 4 – Missing insulation

Figure 5 – Soffit vent termination piece

Inspection Number: 1-3
Address: 3303 Runner's Road
Age: 8 years
Type: Low rent
Condition: Occupied
House Type: Ranch
Bedrooms: 3
Foundation: Concrete block
Heat Type: Gas, forced air
Construction: 2" x 6", modular

Figure 1 - 3303 Runner's Road

Mold and Moisture Conditions: Site drainage was flat, especially under the rear deck. Gutter system was in good condition. Basement walls were reinforced because of buckling. Basement walls were wet (Figures 2 & 3) and standing water was found on the basement floor.

Rainwater Management: A gutter system was present and in good shape. Site drainage was very flat.

Figure 2 – Wet basement walls

Figure 3– Reinforcing pier

Bathroom/Kitchen: No mold was found in the bathroom. The fan was vented through the soffit. The kitchen exhaust fan vented to the outside.

Attic: The attic was insulated with R38 fiberglass batts. Voids and gaps in the attic insulation were visible.

Occupant Notes: There were 5 occupants, 2 adults and 3 children, ages 2, 3, and 7 years. There were no reported health problems or smokers in the household. The family had occupied the home for 4 months.

Inspection Number: 1-4
Address: 3302 Runner's Road
Age: 8 years
Type: Low rent
Condition: Occupied
House Type: Ranch
Bedrooms: 3
Foundation: Poured concrete
Heat Type: Gas, forced air
Construction: 2" x 6", modular

Figure 1 – 3302 Runner's Road

Mold and Moisture Conditions: Site drainage was flat. The rear gutters were full of snow. Water dripping from the gutters was splashing on the siding (Figure 2). Some leaders were missing. Mold was visible on the basement walls (Figure 3). The house had an attached crawl space open to the basement. A ground cover was present, the duct was insulated, foundation walls were not insulated and the vents were sealed. There was a fair amount of clutter in the crawl space.

Figure 2- Back splash against siding from gutter snow melt

Rainwater Management: Site drainage was very flat. Some water ponding was found along the foundation wall in the back.

Bathroom/Kitchen: No mold was found in the bathroom. The fan was vented through the soffit. The kitchen exhaust fan vented to the outside.

Attic: The attic was insulated with R38 fiberglass batts. Voids and gaps in the attic insulation were visible.

Occupant Notes: There were 6 occupants, 3 adults and 3 children ages 9, 11, and 16 years. There were no reported health problems. There were 2 smokers in the home. The family had resided in the home since 2000.

Figure 3 – Mold on basement wall